

CLAIMS

1. An ultrasonic transmitting and receiving apparatus having a structure in which a piezoelectric element is mounted to a bottom of a bottomed casing, the apparatus comprising:

a casing including a bottom, an outer peripheral wall, and an inner peripheral wall, the outer peripheral wall being disposed on an inner face of the bottom and integrally extending away from the bottom, the inner peripheral wall being disposed on the inner face of the bottom, integrally extending away from the bottom, and being arranged inside the outer peripheral wall,

wherein the inner peripheral wall and the bottom define a first recess, and the outer peripheral wall, the inner peripheral wall, and the bottom define a second recess,

the apparatus further comprising:

a piezoelectric element mounted to a portion of the bottom, the portion being exposed to the first recess; and

a vibration isolating member with which the second recess is filled.

2. The ultrasonic transmitting and receiving apparatus according to Claim 1, wherein a cross section of the first recess, the cross section being surrounded by the inner

peripheral wall and defined along a direction parallel to the bottom, has an anisotropic shape.

3. The ultrasonic transmitting and receiving apparatus according to Claim 2, wherein the anisotropic shape is substantially elliptical.

4. The ultrasonic transmitting and receiving apparatus according to any one of Claims 1 to 3, wherein the bottom includes a thick part and a thin part in the portion exposed to the first recess, the thick part being thicker than the thin part and the thin part being thinner than the thick part, and the piezoelectric element is mounted to the thick part.

5. The ultrasonic transmitting and receiving apparatus according to any one of Claims 1 to 4, wherein a cross section of a portion surrounded by an inside face of the outer peripheral wall, the cross section being defined along a direction parallel to the bottom, is circular.

6. The ultrasonic transmitting and receiving apparatus according to any one of Claims 1 to 5, wherein the thickness of the inner peripheral wall is equal to or smaller than the thickness of the outer peripheral wall.